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ABSTRACT

Research was conducted to study systematically the comprehension and production of the pronouns "he, she, him, her" in the language of normal and linguistically deviant children. The purposes of the study were to: observe the manner in which normal children comprehend and produce these four pronouns, in terms of both their use and their distinctive features of sex and case; compare these results with similar phenomena in linguistically deviant children; and determine the general systematic stages of pronoun development. Thirty linguistically normal and thirty linguistically deviant children were tested. Each subject was asked to perform one comprehension and one production test involving the use of four dolls: father, mother, son, and daughter. Responses were tape-recorded and transcribed. Three main classes of errors emerged: errors of gender, of reference, and of both gender and reference. Errors of gender and reference were most prevalent in the normal group; errors of gender reversal were most common in the deviant group. Other findings included: (1) females in both groups tended to make fewer errors than males; (2) generally, high performance on comprehension tasks was accompanied by high performance on production tasks; (3) generally, comprehension task scores were equal to or greater than those received on production tasks; and (4) the deviant group performance fell well below the normal group performance. (AM)

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# THE COMPREHENSION AND PRODUCTION OF THE ANAPHORIC PRONOUNS "HE, SHE, HIM, HER" IN NORMAL AND LINGUISTICALLY DEVIANT CHILDREN

a preliminary report*

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INTRODUCTION

1.0 In assessing the language development of a child, the speech pathologist will, when possible, determine the adequacy or inadequacy of the child's grammar by comparing it with a standardized developmental time table. In the past, time tables of this sort have been restricted to quantitative measures, length of utterance being an example of one such measure (McCarthy, 1954). In recent years, however, such time tables have also included grammatical feature analyses and the nature of their stages of development.

It is not difficult to realize the rationale for describing the developmental stages of grammatical phenomena. Such a description allows the speech pathologist, when examining a child's grammar, to determine the stage of development of a particular feature in that grammar. When a description of this nature has been made, and it has been determined that the feature being studied is in some way deviant, the speech pathologist can determine the starting point for training. Knowing the developmental stages of the feature allows the therapist, in training, to carry the child through each stage in a sequential, hierarchically-ordered fashion.

Investigators are only beginning to make such analyses possible, and many grammatical features remain to be described in terms of their development. Moreover, very few inquiries have been made into the development of these phenomena in linguistically deviant children. One feature that has been observed as difficult for deviant children is the pronoun. At the same time, little systematic research has been conducted to determine the manner in which normal children develop this feature.

1.1 Pronouns may be observed for the development of the specific forms and their use as an anaphoric element. The four forms selected for study here are "he, she, him, her". Using the approach of representing pronouns as features on noun segments, we follow Ingram (1971) and designate these as in (1).

(1)

| he | she | him | her |
|---|---|---|---|
| {-Sp, -Hr}' | {-Sp, -Hr}' | {-Sp, -Hr}' | {-Sp, -Hr}' |
| [+ Masc] | [- Masc] | [+ Masc] | [- Masc] |
| [- Fem ] | [+ Fem ] | [- Fem ] | [+ Fem ] |
| [+ Anim] | [+ Anim] | [+ Anim] | [+ Anim] |
| ⟨- FM ⟩ | ⟨- FM ⟩ | ⟨- FM ⟩ | ⟨- FM ⟩ |
| ⟨+ Pro⟩ | ⟨+ Pro⟩ | ⟨+ Pro⟩ | ⟨+ Pro⟩ |
| ⟨- Pl ⟩ | ⟨- Pl ⟩ | ⟨- Pl ⟩ | ⟨- Pl ⟩ |
| ⟨- Acc⟩ | ⟨- Acc⟩ | ⟨+ Acc⟩ | ⟨+ Acc⟩ |

Key:

| | | |
|---|---|---|
| Sp = speaker | FM = first mention | {} = deictic feature |
| Hr = hearer | Pro = pronoun | [] = semantic feature |
| Masc = masculine | Pl = plural | ⟨⟩ = syntactic feature |
| Fem = feminine | Acc = accusative | |
| Anim = animate | | |

The curly brackets {} represent the deictic features of the pronouns, i.e., the roles that each fill in the speech act. All four pronouns are deictically the same; they are - Speaker, -Hearer, and limited to one referent. Square brackets [] designate semantic features and show that the forms differ in sex and agree in animacy. "he, him" are [+ masculine] and "she, her" are [+ feminine]. Angle brackets ⟨⟩ enclose syntactic features. All four are ⟨- First Mention⟩ i.e., they refer back to a noun already introduced into the discourse. They are also ⟨+ Pronoun⟩ and ⟨- Plural⟩, the latter being necessary to account for the necessary agreement with verbs. They differ in case, with the subject pronouns "he, she" being ⟨- Accusative⟩ and the object pronouns "him, her" being + Accusative . Overall, two features fully distinguish the four forms, [± Masculine] and ⟨± Accusative⟩.

Pronouns are used anaphorically to replace nouns or noun phrases. There are two cases that will concern us here where the anaphoric use of pronouns is inappropriate[1]. The first is when they are used as ⟨+ First Mention⟩, that is, used to introduce referents. The sentence she carried him used at the beginning of a discourse could only mean someone carried someone else. The actual referents need to be first designated. The second case arises when there are two or more referents and ambiguity would arise. For example, if there are two males and two females, the use of the above sentence would be ambiguous. A sentence with the appropriate nominal referents would be necessary. This allows us to suggest the following two rules.

(2) I. When two or fewer referents of different sex ⟨- FM⟩ → ⟨+ Pro⟩
II. When two or more referents of same sex ⟨- FM⟩ → ⟨- Pro⟩

In terms of language acquisition, this indicates that the child not only needs to acquire the forms of pronouns, but also the appropriate conditions concerning when they should not be used in order to avoid ambiguity.

1.2 Previous studies of pronoun development have generally occurred in tandem with the study of other parts of speech. For this reason, most investigators in the study of child language have suggested the age at which pronouns appear, but to date, no attempt has been made to define the developmental stages of pronouns, either in terms of the forms in (1) or the rules in (2). The earlier studies were concerned with quantitative measures such as the mean percentage of pronouns occurring in total speech samples of children. Studies along these lines include those of McCarthy (1954), Templin (1957), Davis (1938), and Mackey (1928). The latter presents the most comprehensive treatment of pronouns in this approach. In addition, using vocabularies from 8 children, he determined an order of acquisition based upon a weighing system whereby each child's forms were given a number, with earlier appearing forms receiving a higher number. The totals of these numbers for each form across the eight children provided the order of acquisition. He found that "him or her" appeared before "he or she", claiming that this was due to the fact that the child always hears himself referred to in the objective. He does not discuss whether or not the forms were used appropriately.

In a more recent study, Huxley (1970) investigated the pronoun systems in the free speech of two children, K and D, beginning when they were 2,3 and ending when they were 4,0. Huxley states that K used the correct adult forms of the pronouns at the outset of the study, while D did not use a personal pronoun until 2,8 when he used "he". This emergence was followed by a ten-week period in which no pronouns were used. "Him" emerged next in both subject and object positions. It wasn't until D was 3,4, however, that "he" returned, but it was used only to refer to a person either in view, or know to whomever D was talking. At 3.5, "he" was used to refer to a person previously mentioned.

The development of "she" in D's speech followed much the same pattern as the masculine pronoun. At 2.3, D used "she" for the first time and retained it in his speech, using it, though infrequently, until 2.9 when "she" gave way to "her". "She" remained absent for five and a half months, while "her" was used for both nominative and accusative cases. At 3.2, D used both she + copula and her + copula; "her" being followed by a "she" tag question, i.e., "Her is jolly strong, isn't she?" For the next fourteen weeks, "her" predominated, but from 3.6 onwards, "she" was always used in the nominative case. D never returned to the use of "her" in this position.

1.3 The following study attempted to systematically study the comprehension and production of the pronouns "he, she, him, her" in the language of normal and linguistically deviant children. The purposes were three fold:

1) to observe the manner in which normal children comprehend and produce these four pronouns, both in terms of their distinctive features of sex and case as shown in (1), and their use according to the rules of appropriateness in (2).
2) to compare these results in some way with similar phenomena in linguistically deviant children, and
3) to determine the general systematic stages of pronoun development.

METHOD

2.0 Subjects: Sixty children were used as subjects in the study. these comprised two groups of thirty children each, one group considered normal in their acquisition of language, and the other group language-disturbed, or linguistically deviant.

The normal subjects were taken from Bing Nursery School at Stanford University, while three sources provided the deviant subjects: Idylwild School in Los Gatos, California; Brookview School in Cupertino, California; and the Scottish Rite Institute for Childhood Aphasia at Stanford University.

Because of the difficulty encountered in finding deviant children, i.e. children whose primary problem is linguistic rather than emotional or intellectual, it was not possible to match the two groups except in number. The group of normal subjects had an age span of 1,5 years, from 3,0 to 4,5, while the deviant children ranged in age from 4,0 to 9,5. The group of normal subjects was divided into three equal subgroups according to age: 3.0 to 3.5 (Group A), 3.6 to 3.11 (Group B), and 4.0 to 4.5 (Group C). The linguistically deviant children, on the other hand, comprised three equal subgroups according to linguistic development as determined by mean length of utterance (MLU). The first group, lowest in linguistic development with 1 and 2 word utterances, had a mean age of 5,9 (Group I); the second group had a mean length of utterance of 3 words and a mean age of 6,2 (Group II); and the third group, the most advanced in language development, with a mean length of utterance of 4 or more words, had a mean age of 7,8 (Group III).

Sex of the subjects was a concern in the normal group. Therefore, fifteen male and fifteen female subjects were chosen. In the deviant population, however, males outnumber females by approximately two to one, and the present study maintains this imbalance. Thus, there were eleven deviant females and nineteen deviant males that participated in the study.

The divergent natures of the two groups of subjects did not allow conclusive comparative statements to be drawn. This study only attempted to describe the subjects' acquisition and development of pronoun use, and only in special cases will inferences be made.

2.1 Materials: There were four dolls used in the experiment, two female and two male, with one doll of each sex being an "adult" doll and the other a "child". These dolls comprised a family of dolls, a father (adult male): $M_2$, mother (adult female): $F_2$, sister (child female): $F_1$, and brother (child male): $M_1$. Dolls were chosen as the primary stimulus objects because of their obvious manipulability.

2.2 Procedure: Each child participated in two tasks, both of which required the use of the dolls. There was a production task followed by a comprehension task. Production was tested by asking the child to describe the actions between the dolls which the examiner manipulated. For comprehension, each subject manipulated dolls according to the examiner's instructions.

2.2.1 Production Task: As stated, a subject's use of pronouns was tested by asking him to describe the action occurring between experimenter-manipulated dolls. This task, which took approximately 15 minutes, consisted of sixteen items of varying difficulty. Items 1-4 involved the use of one doll performing one action, i.e., the girl doll sleeping. Items 5-8 involved the use of two dolls, one performing an action on the other, i.e., the girl doll kissing the boy doll. The correct adult response to these first eight items would be the appropriate pronoun forms. Items 9-16 were the most complex. Although only one doll performed an action on only one other doll, as in 5-8, the subject was presented with all four dolls. Consequently, ambiguity would be introduced through the use of pronouns and the appropriate adult response would be the use of nouns, following rule II. These 16 items were randomly ordered, as was the order of presentation of the dolls for each item. The examiner first presented the dolls, following each presentation with "Who do you see?" Then the examiner performed the particular interaction of the dolls, followed by the question "What's happening?" If the child needed additional encouragement to speak, the examiner followed "What's happening?" with similar phrases such as "Tell me, what do you see?" The child was given verbal reinforcement following his utterances. This reinforcement, positive in nature, was given in a random fashion after correct and incorrect replies. The randomness of reinforcement was intended to minimize learning which could occur throughout the task. The subject's responses were tape recorded for later transcription.

2.2.2 Comprehension Task: A subject's comprehension of pronouns was tested by asking him to manipulate dolls according to the examiner's instructions. The same sixteen stimulus sentences were used. (See Appendix A). For sentences 9-16, compound sentences were used to eliminate ambiguity by the examiner. These sentences were essentially two

simple subject-verb-object constructions conjoined by "and now." Furthermore, the first SVC construction involved the use of two nouns and the second involved the pronominalized forms of these nouns, e.g. "The mother pulls the father and now she is carrying him," and then, "show me - she is carrying him." It was necessary for the examiner to avoid stressing the pronouns in the second part of the construction. Stress applied to either pronoun could easily have influenced the conditions of co-reference. This problem was therefore avoided by the examiner's stressing of the verb phrase.

The ordering of the items, as in the previously described task, was random, as was the order of presentation of the dolls. In the comprehension task, the examiner did not ask the child to name the dolls before each item was presented. The examiner simply placed the dolls on the table in front of the child in a predetermined order. The child's responses were recorded by the examiner following each time. Notations as to the nature of the response were made on score sheets. As in the case of the production task, the child's responses were positively reinforced. Again, these reinforcements were given randomly, despite the child's response.

RESULTS AND DISCUSSION

3.0 Comprehension Task: The responses on the comprehension task were scored according to the number of items on which errors were made. These errors were then analyzed according to type. For each child, the total number of correct responses for each sentence group (i.e., items 1-4, 5-8, 9-16) was calculated. This was followed by the computation of the mean percentage of correct scores for each age group of the normal children, and each language group of the deviant children.

3.0.1 Overall Performance: The scores for the three groups of normal subjects was shown in Table 1. Except for the scores received by Group A, a significant decrease in the correct scores for items 1-8 to items 9-16 was evident. The mean scores on items 1-4 and 5-8 for Group A subjects were about the same as those received on items 9-16. The drop in performance for groups B and C is not surprising, however, in view of the complexity of sentences 9-16. What is surprising, is that no corresponding drop in scores occurred for the youngest children, Group A.

3.0.2 Analysis of Errors: Three main classes of errors emerged. These were errors of gender, reference, and gender and reference, hereafter referred to as "both." Errors of gender were those which the subject made when confusing "he" and "she" or "him" and "her". Errors of reference could occur only on items 9-16 and were made when the adult and child dolls were confused. "Both" errors could also occur only on items 9-16. The choice of $M_2$ for $F_1$ is an example of such an error.[2]

Table 1. Percentages of Correct Responses on Comprehension Items For 3 Groups of Normal and 3 Groups of Deviant Subjects.

| | GROUPS | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Normal | | | | Deviant | | | |
| Items | A | B | C | | I | II | III | |
| 1-4 | .88 | .95 | .97 | .93 | .75 | .90 | .90 | .85 |
| 5-8 | .80 | .95 | .97 | .91 | .70 | .82 | .85 | .79 |
| 9-16 | .79 | .80 | .88 | .82 | .58 | .81 | .75 | .71 |
| | .86 | .90 | .91 | | .68 | .84 | .83 | |

Although the subjects in the normal group were equally divided according to sex, it was found that the female subjects made a total of 15 errors, or 25 per cent of all the errors made by both. On the other hand, male subjects made 46 errors, or 75 per cent of the total errors.

The performance of the deviant subjects on the same task fell well below that of the normal children. The scores of the three groups on items 1-16 are also shown in Table 1. As with the normal subjects, the deviant subjects in Groups II and III seemed to show a leveling off of performance. Again, Group I fell well below Groups II and III. Also, little difference was shown in percentage scores from Group II to Group III, but a great difference existed in percentage scores from Group I to Group II.

Groups I and III also showed a loss in comprehension from items 5-8 to items 9-16. In fact, the percentage loss was approximately the same for each group. Group II, however, did not experience the loss in comprehension from items 5-8 to items 9-16 of the other groups, maintaining a percentage score of 82 for items 5-8 and 81 for items 9-16.

It was found that the eleven linguistically deviant girls made 36 errors and that the nineteen deviant boys made 81 errors, resulting in the girls making 32% of the errors, and the boys 68%.

For the normal subjects, it was found that errors of gender and reference occurred with approximately the same frequency, those of gender occurring 52 percent of the time and those of reference occurring 48 percent of the time. Of the errors made by the female subjects, 39.9 percent were errors involving the comprehension of gender, while 60.1 percent involved the understanding of reference. Of the errors made by male subjects, 54.3 percent were errors of gender, while 45.7 percent were errors of reference.

Considering the three deviant groups, it was found that errors of gender reversal were the most prevalent, occurring 31.8 percent of the time. Errors of gender alone occurred with 23.2 percent frequency, while reference reversals and "both" reversals followed, each with a frequency

occurrence of 9.4. Within the major classifications, errors of gender occurred 62.6 percent of the time, while those of reference occurred 37.4 percent of the time. Of all the errors made, those falling in categories of reversals occurred with 58.6 percent frequency.

3.1 Production Task: The data were analyzed in order to determine three things: (1) subjects' use of pronouns, (2) subjects' use of pronouns when their occurrence was obligatory, and (3) subjects' use of noun forms to resolve ambiguous pronominal reference.

3.1.1 Use: The use of pronouns was determined simply by adding the total number of occurrences in each subject's utterances. In order to determine substitution systems, each of the four adult pronouns under study was given a position number. The pronoun, "he" fills Position I, while Positions II, III, and IV are filled by "she," "him," and "her," respectively. Substitutions often occurred in these positions, however, so percentage of occurrence was determined. Eighty percent was established as the criterion for determining consistency of use. If, for example, a subject used"she" in Position I, 80 percent of the time, and used "he" in that position only 20 percent of the time, it was possible to say that "she" filled the function of Position I.

Table 2 shows the pronoun forms used by the three groups of normal subjects to fill positions I-IV. Starred forms occurred only one time in the subjects' responses. Without exception, when substitutions occurred for "he," the form was always "him"; "her" was used for "him," and "him" was used for "her." When substitutions occurred for "she," however, they were either "he" or "her." Also, substitutions in the accusative case always occurred with the accusative pronoun of opposite gender, but when substitutions occurred in the nominative case, they were either of nominative or accusative case.

If it is assumed that children acquire forms in numerical order, first acquiring one, then acquiring two, and so on to four, then it is possible to observe stages of pronoun use according to occurrence, and substages of pronouns according to functions. One example of this may be seen in the use of "he" in positions I and II. In this case, the subject used one form to perform two functions. Thus, Table 2 was reduced to Table 3.

Table 2 also presents the forms filling positions I-IV for the three groups of deviant subjects. The use of substitute pronouns by deviant children differed from that of normal children. "He" was either present or absent in every case but one, where a child inserted "the." Of the fifteen children who used pronouns at all, eleven had the use of the pronoun, "he." In all cases where a pronoun filled position II, the pronouns were"he," occurring five times, and "him" and "the" each occurring once.

Table 2. Pronouns Used 80% for Normal and Deviant Subjects

| NORMAL | | | | | DEVIANT | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Subj. | HE | SHE | HIM | HER | Subj. | HE | SHE | HIM | HER |
| Group A | | | | | Group I | | | | |
| 1 | he | x | x | x | 31 | x | x | him* | x |
| 2 | he* | he* | x | her* | 32 | x | x | x | x |
| 3 | x | x | x | her | 33 | he* | x | x | him* |
| 4 | him | her | him | her | 34 | x | x | x | x |
| 5 | he | x | him | him | 35 | x | x | x | x |
| 6 | x | she* | her* | her | 36 | x | x | x | x |
| 7 | he | x | x | her | 37 | x | x | x | x |
| 8 | he* | x | x | x | 38 | he* | x | x | x |
| 9 | he | she | him | her | 39 | x | x | x | x |
| 10 | he | he | x | him* | 40 | x | x | x | x |
| Group B | | | | | Group II | | | | |
| 11 | he | x | x | her | 41 | x | x | x | x |
| 12 | he | x | x | her | 42 | x | x | x | x |
| 13 | he | she | him | her* | 43 | he | x | her* | x |
| 14 | he | x | him* | her* | 44 | he | he | x | x |
| 15 | he | x | her | her | 45 | he | he | him* | x |
| 16 | he | x | him | her | 46 | he* | x | him | her |
| 17 | x | x | x | x | 47 | he* | x | x | her* |
| 18 | x | x | x | x | 48 | x | x | x | x |
| 19 | he | x | x | x | 49 | x | x | x | x |
| 20 | he | x | him | her | 50 | he | he | x | her* |
| Group C | | | | | Group III | | | | |
| 21 | he | she | him* | her* | 51 | x | x | her* | her |
| 22 | x | she | x | her* | 52 | x | x | x | x |
| 23 | he | she | x | her | 53 | x | x | x | x |
| 24 | he | she | him | her | 54 | x | x | x | x |
| 25 | he | she | him* | her | 55 | x | x | x | x |
| 26 | x | x | x | her | 56 | he | x | her | her |
| 27 | he | she | x | her | 57 | he | he | him | x |
| 28 | him | her | x | her | 58 | the | the | x | her |
| 29 | he | she | x | her* | 59 | he | he | her | her* |
| 30 | x | x | him | her | 60 | x | him | him | x |

Table 3. Stages of Pronoun Use for Normal and Deviant Subjects

| | | | I HE | II SHE | III HIM | IV HER | Number of Subjects at Each Stage NORMAL | DEVIANT |
|---|---|---|---|---|---|---|---|---|
| Stage 0 | | | x | x | x | x | 2 | 15 |
| Stage 1 | | | | | | | | |
| | 1 function | A. | he | x | x | x | 3 | 1 |
| | | B. | x | x | x | her | 2 | 0 |
| | | C. | x | x | him | x | 0 | 1 |
| | 2 functions | A. | he | he | x | x | 0 | 1 |
| | | B. | x | x | her | her | 0 | 1 |
| | | C. | x | him | him | x | 0 | 1 |
| Stage 2 | | | | | | | | |
| | 2 functions | A. | he | x | x | her | 3 | 1 |
| | | B. | x | x | him | her | 1 | 0 |
| | | C. | x | she | x | her | 1 | 0 |
| | | D. | he | x | her | x | 0 | 1 |
| | | E. | he | x | x | him | 0 | 1 |
| | 3 functions | A. | he | he | x | her | 1 | 1 |
| | | B. | he | x | him | him | 1 | 0 |
| | | C. | x | she | her | her | 1 | 0 |
| | | D. | he | he | x | him | 1 | 0 |
| | | E. | he | x | her | her | 1 | 0 |
| | | F. | him | her | x | her | 1 | 0 |
| | | G. | he | he | him | x | 0 | 2 |
| | | H. | he | x | her | her | 0 | 1 |
| | | I. | the | the | x | her | 0 | 1 |
| | 4 functions | | he | he | her | her | 0 | 1 |
| Stage 3 | | | | | | | | |
| | | A. | he | x | him | her | 3 | 1 |
| | | B. | he | she | x | her | 3 | 0 |
| Stage 4 | | | he | she | him | her | 5 | 0 |

"Him" was most always substituted by the use of "her" in Position III. 'Him" substituted for "her," only one time. Generally speaking, positions I-IV were filled in the following way: I - "he," II - "he," III - "him/her," and IV - "her." Position I was the most stable, followed in order by positions IV, III, and II.

As for the normal subjects, the data were reordered to show stages of pronoun development. Table 3 presents the forms used by the deviant children and the positions they fill. This table indicates that none of the children in the deviant sample had established the use of four pronouns with any degree of stability.

3.1.2 Percent of Obligatory Pronouns Supplied: Each subject's responses were again examined in order to determine whether obligatory subject and/or object pronominal forms were omitted. If a subject said, for example, "Kissing her," for "He is kissing her," only one obligatory pronoun was omitted. In sentences 1-8 where nouns were used instead of pronouns, or vice versa for sentences 9-16, the obligation of providing a placeholder was met, although the response was inappropriate.

Normal subjects' use of pronouns when obligation was applied is shown on Table 4. This table reveals that over one-third of the subjects did not use pronouns when their occurrence was obligatory. It can be said with some certainty, however, that the pronouns which appeared when obligation was applied were forms which were stabilized in the subjects' production.

When comparing these data with those of Table 2, it can be seen that nearly one-half of the pronouns appearing on Table 2 were omitted on Table 4. Moreover, it appears that when obligation was applied, each position lost about half of the pronouns which occurred before obligation was applied.

The application of obligation required the subjects to not only know when to use pronouns, but to use them whenever obligatory. Notice that of the remaining pronouns, all of them, with the exception of four, were used correctly. The four that were used as substitutes occurred in positions I, II, and III, leaving position IV which required the use of "her" as the most stable. Position I, "he," followed in stability and frequency of use. "Him" appeared to be as stable as "he," though it is not as frequently used. "She" is not only the least stable, but the least frequently used.

Table 5 shows the stages of pronouns occurring in the speech of the children and the positions they filled when obligation was applied. There was a movement from the use of four pronouns in four positions to the lesser use of pronouns, with a considerable increase in the number of subjects whose use of pronouns did not satisfy the requirements of the 80 percent level when obligation was applied.

Table 4. Pronouns Used at 80% Obligatory Occurrence for Normal and Deviant Subjects

| | NORMAL | | | | | DEVIANT | | | |
|---|---|---|---|---|---|---|---|---|---|
| | I | II | III | IV | | I | II | III | IV |
| Subj. | HE | SHE | HIM | HER | Subj. | HE | SHE | HIM | HER |
| Group A | | | | | Group A | | | | |
| 1 | he | x | x | x | 31 | x | x | him* | x |
| 2 | x | x | x | x | 32 | x | x | x | x |
| 3 | x | x | x | x | 33 | x | x | x | x |
| 4 | x | x | x | x | 34 | x | x | x | x |
| 5 | x | x | him | x | 35 | x | x | x | x |
| 6 | x | she* | her* | her | 36 | x | x | x | x |
| 7 | x | x | x | her | 37 | x | x | x | x |
| 8 | x | x | x | x | 38 | x | x | x | x |
| 9 | he | she | x | her | 39 | x | x | x | x |
| 10 | he | he | x | x | 40 | x | x | x | x |
| Group B | | | | | Group B | | | | |
| 11 | x | x | x | x | 41 | x | x | x | x |
| 12 | he | x | x | her | 42 | x | x | x | x |
| 13 | x | x | him | x | 43 | he | x | x | x |
| 14 | x | x | x | x | 44 | x | x | x | x |
| 15 | x | x | x | her | 45 | he | he | x | x |
| 16 | he | x | him | x | 46 | x | x | him | her |
| 17 | x | x | x | x | 47 | x | x | x | her* |
| 18 | x | x | x | x | 48 | x | x | x | x |
| 19 | he | x | x | x | 49 | x | x | x | x |
| 20 | he | x | him | her | 50 | x | x | x | x |
| Group C | | | | | Group C | | | | |
| 21 | he | she | him* | her* | 51 | x | x | her* | her |
| 22 | x | x | x | x | 52 | x | x | x | x |
| 23 | he | she | x | her | 53 | x | x | x | x |
| 24 | x | x | him | her | 54 | x | x | x | x |
| 25 | x | x | x | x | 55 | x | x | x | x |
| 26 | x | x | x | x | 56 | he | x | her | her |
| 27 | he | x | x | her | 57 | he | he | him | x |
| 28 | him | her | x | her | 58 | x | x | x | her |
| 29 | he | she | x | her | 59 | he | he | x | x |
| 30 | x | x | him | her | 60 | x | him | him | x |

Table 5. Stages of Pronoun Use When 80% Obligation Is Applied For Normal and Deviant Subjects

| | | I HE | II SHE | III HIM | IV HER | Number of Subjects at Each Stage NORMAL | DEVIANT |
|---|---|---|---|---|---|---|---|
| Stage 0 | | | | | | | |
| | | x | x | x | x | 11 | 19 |
| Stage 1 | | | | | | | |
| 1 function | A. | x | x | x | her | 2 | 2 |
| | B. | he | x | x | x | 2 | 1 |
| | C. | x | x | him | x | 2 | 1 |
| 2 functions | A. | he | he | x | x | 1 | 2 |
| | B. | x | x | her | her | 0 | 1 |
| | C. | x | him | him | x | 0 | 1 |
| Stage 2 | | | | | | | |
| 2 functions | A. | x | x | him | her | 2 | 1 |
| | B. | he | x | x | her | 2 | 0 |
| | C. | he | x | him | x | 1 | 0 |
| 3 functions | A. | him | her | x | her | 1 | 0 |
| | B. | x | she | her | her | 1 | 0 |
| | C. | he | x | her | her | 0 | 1 |
| | D. | he | he | him | x | 0 | 1 |
| Stage 3 | | | | | | | |
| | A. | he | she | x | her | 2 | 0 |
| | B. | he | x | him | her | 1 | 0 |
| | C. | he | she | x | her | 1 | 0 |
| Stage 4 | | | | | | | |
| | | he | she | him | her | 1 | 0 |

Table 4 also shows how linguistically deviant subjects used pronouns when obligation was applied. Only eleven subjects used any pronouns at all, and none of these subjects used four different pronouns or filled four positions. The greatest number of pronouns used by any subject was two. "Him" and "her" occurred with equal frequency in their respective positions, I and IV, and neither had substitutions, giving reason to believe that their use in the subjects' speech was the most stable and probably permanent. Position III was occupied by six pronouns, but only four were the correct form, "him"; "her" continued to be used as a substitute form. Position II was filled by four subjects using masculine proforms. "She" was never used, and "he" was the most frequent substitute. Subjects who substituted "he" for "she," used "he" correctly in position I. This may have been a result of over-generalization of an established form.

Table 5 shows the stages of forms and the positions they occupied when obligation was applied. None of the linguistically deviant subjects reached the level of four forms in four positions. In fact, the highest level reached was that of two forms in three positions, by two subjects.

3.1.3 Occurrence of Noun Forms: The subjects' responses were examined in order to determine whether subjects understood the rules:

I. Two or fewer referents of different sex: ⟨-FM⟩ → ⟨+pronoun⟩
II. Two or more referents of same sex: ⟨-FM⟩ → ⟨-pronoun⟩

Items 1-4 and 5-8 were designed to test understanding of Rule I, while items 9-16 tested understanding of Rule II. It was decided that if a group of subjects used a ⟨±pronoun⟩ form 80 percent of the time in the correct groups of responses, they had generalized the above rules.

The children in group A of the normal subjects used pronouns 89 percent of the time in their responses to items 1-4. On the more difficult items where both a subject and object pronoun were required, these subjects used pronouns 81 percent of the time. On items 9-16, the use of pronouns decreased to 62.5 percent. However, nouns were used only 37.5 percent, far below the 80 percent criterion. These figures indicate, then, that the normal children in this group had generalized Rule I, but not Rule II.

The subjects in group B of the normal children received a score of 95 percent on items 1-4 and a score of 97 percent on items 5-8. This is an indication of the fact that the subjects were aware of Rule I. On items 9-16, however, the subjects received a score of 26 percent in their use of nouns, indicating that Rule II had not been learned.

A score of 100 percent was received by normal subjects in Group C on items 1-4. On items 5-8, however, a score of 73 percent was received. These figures suggest that the subjects in this age group generalized Rule I when only one pronoun was required, but were not able to do so when two pronouns were needed. On items 9-16, because nouns were used only 40 percent of the time, Rule II had not been learned.

In the deviant group, twelve subjects on the lowest language level used only one noun and one pronoun on items 1-4, hardly a large enough number from which to speculate generalization of rules. On sentences 5-8, however, seven nouns and no pronouns were used, indicating that Rule I had not been generalized by these children. Nouns ( -pronoun) were used by 70 percent of the children in this group, an indication that Rule II was not yet learned.

Pronouns were used 47 percent of the time in items 1-4 by deviant subjects in this group II. In items 5-8, pronouns were used 73 percent of the time, both figures indicating lack of Rule I. Rule II was also not known by these subjects as indicated by lack of knowledge of Rule I and the fact that nouns occurre. 43 percent of the time in items 9-16.

The deviant subjects in group II used pronouns on items 1-4 45 percent of the time, while on items 5-8 pronouns were used 38 percent of the time. These figures suggest that Rule I had not been learned by this group of subjects. On items 9-16, nouns were used 65 percent of the time. This coupled with ignorance of Rule I, indicates lack of generalization of Rule II.

Table 6 shows what groups of children were able to generalize Rules I and II.

Table 6. Groups Generalizing Rule I and Rule II
(Normal and Deviant Subjects)

| | Items 1-4 Rule I | Items 5-8 Rule I | Items 9-16 Rule II |
|---|---|---|---|
| Normal Subjects | | | |
| Group A | yes | yes | no |
| Group B | yes | yes | no |
| Group C | yes | no | no |
| Deviant Subjects | | | |
| Group I | no | no | no |
| Group II | no | no | no |
| Group III | no | no | no |

3.2 Comparison of Comprehension and Production Scores: For each group of items, the correlation between the precentage scores received on the comprehension task and those received on the production task was computed. The correlation coefficients for each group were as follows:

Normal Subjects

| | |
|---|---|
| Items 1-4 | -.17 |
| 5-8 | +.40 |
| 9-16 | +.34 |

Deviant Subjects

| | |
|---|---|
| Items 1-4 | +.08 |
| 5-8 | +.35 |
| 9-16 | +.46 |

What these correlation coefficients show is that, for the most part, high performance scores on the comprehension task were accompanied by high performance scores on the production task, and low performance scores on one task were accomplanied by low performance scores on the other. Very little association exists between the two tasks; an individual's performance on one task could not predict his performance on the other.

It should be noted that except in rare cases, the scores of the comprehension task were equal to or greater than those received on the production task. This supports the thesis of Frazer, Bellugi, and Brown (1963), who stated that particular features of an utterance are generally understood before the same features are produced.

3.2.1 Individual Systems: The responses of some of the individual subjects on both comprehension and production warrant investigation. Table 7 presents a cross-section of the subjects in the study; they illustrate both typical and deviant developmental patterns.

The responses of Subject 1 present an excellent example of how comprehension precedes production. Subject 4 had good comprehension of all forms but used only two forms, "him" and "her." The accusative forms had generalized to positions I and II, a confusion in case. Subject 4 was able to determine the correct use of gender. The responses of Subject 5 show how gender, not case, can become confused. The comprehension results, however, show that the child clearly understands gender. Subject 16 can be directly compared to 4. Although he had the same score on comprehension, he does not use pronouns to criterion for the subject positions. The responses of Subject 17 were highly unusual. Although she showed perfect comprehension, no pronouns appeared in her utterances. As the above responses indicate, Subject 24 was in the final stages of pronoun stabilization. The responses of Subject 28 were unusual in that "her" was used for both positions requiring a [+Fem] pronoun. "Him," on the other hand, was used for only one [+Mas] position, and that position did not require the accusative feature.

The responses of Subject 39 were typical of about 50 percent of the deviant subjects. Subject 56 shows the generalization of [+Fem] for the accusative pronouns, but only "he" in the subject ones. The unusual pattern of use in the responses of Subject 57 indicates difficulty with gender. Subject 58 evidenced the most unusual pattern of pronoun use of all the deviant and normal children. For Subject 58, the article, "the" was a pronoun. Subject 60 not only had difficulty with the correct use of case, but had difficulty with the use of gender. It seems as though this child, having learned the correct use of "him," was generalizing it to other positions of use.

Table 7. Some Individual Systems of Normal and Deviant Subjects

| | Production (80% use) | | | | Comprehension | | |
|---|---|---|---|---|---|---|---|
| Normal | He | She | Him | Her | 1-4 | 5-8 | 9-16 |
| 1 | he | x | x | x | 100 | 100 | 100 |
| 4 | him | her | him | her | 100 | 100 | 88 |
| 5 | he | x | him | him | 100 | 100 | 100 |
| 16 | x | x | him | her | 100 | 100 | 88 |
| 17 | x | x | x | x | 100 | 100 | 100 |
| 24 | he | she | him | her | 100 | 100 | 100 |
| 28 | him | her | x | her | 100 | 100 | 88 |
| Deviant | | | | | | | |
| 39 | x | x | x | x | 100 | 75 | 75 |
| 56 | he | x | her | her | 100 | 100 | 88 |
| 57 | he | he | him | x | 100 | 75 | 63 |
| 58 | the | the | x | her | 100 | 50 | 63 |
| 60 | x | him | him | x | 75 | 100 | 88 |

FOOTNOTES

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[1]Another obvious case of inappropriate use concerns the violation of syntactic constraints when coreference is required, c.f. Ross (1969), Langacker (1963). See Chomsky (1969) for a developmental study into this particular aspect.

[2]See Webster (1972) for a more complete discussion of the error analysis.

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# APPENDIX A

## COMPREHENSION PROTOCOL

Name_____ Sex_____ Date_____

Birthdate_____ Age_____ School_____ Group_____

| Item | Doll Order | |
|---|---|---|
| 7 | $F_1M_1$ | She is kissing him.<br>$M_1F_1$ $M_1F_1$ |
| 14 | $M_2F_1F_2M_1$ | The girl chases the mother and now she is pulling her.<br>$M_1F_1M_2F_2$ $M_1F_1M_2F_2$ |
| 13 | $F_2M_2F_1M_1$ | The girl kisses the boy and now she is patting him.<br>$M_1F_1M_2F_2$ $M_1F_1M_2F_2$ |
| 11 | $M_2F_2M_1F_1$ | The father chases the girl and now he is tickling her.<br>$M_1F_1M_2F_2$ $M_1F_1M_2F_2$ |
| 3 | $F_1M_1$ | She is sleeping.<br>$M_1F_1$ |
| 6 | $M_1F_1$ | He is kicking her.<br>$M_1F_1$ $M_1F_1$ |
| 2 | $F_1M_1$ | He is hopping.<br>$M_1P_1$ |
| 4 | $M_1F_1$ | She is jumping.<br>$M_1F_1$ |
| 12 | $F_1F_2M_2M_1$ | The father pulls the boy and now he is tripping him.<br>$M_1F_1M_2F_2$ $M_1F_1M_2F_2$ |
| 1 | $M_1F_1$ | He is flying.<br>$M_1F_1$ |
| 8 | $M_1F_1$ | She is pushing him.<br>$M_1F_1$ $M_1F_1$ |

| Item | Doll Order | |
|---|---|---|
| 5 | $F_1M_1$ | He is hugging her.<br>$M_1F_1$ $M_1F_1$ |
| 9 | $M_1M_2F_1F_2$ | The boy hits the girl and now he is chasing her.<br>$M_1F_1M_2F_2$ $M_1F_1M_2F_2$ |
| 15 | $F_2M_1F_1M_2$ | The mother chases the girl and now she is hitting her.<br>$M_1F_1M_2F_2$ $M_1F_1M_2F_2$ |
| 16 | $M_2M_1F_2F_1$ | The mother pulls the father and now she is carrying him.<br>$M_1F_1M_2F_2$ $M_1F_1M_2F_2$ |
| 10 | $F_1M_2M_1F_2$ | The boy tickles the father and now he is riding him.<br>$M_1F_1M_2F_2$ $M_1F_1M_2F_2$ |

APPENDIX B

PRODUCTION SCORE SHEET

Name _____ Sex _____ Date _____

Birthdate _____ Age _____ School _____ Group _____

| Item No. | Doll Order | Stimulus | Response |
|---|---|---|---|
| 6 | $M_1F_1$ | He is kicking her. $M_1$ $F_1$ | |
| 5 | $F_1M_1$ | He is hugging her. $M_1$ $F_1$ | |
| 2 | $F_1M_1$ | He is hopping. $M_1$ | |
| 10 | $F_1M_2M_1F_2$ | He is riding him. $M_1$ $M_2$ | |
| 9 | $M_1M_2F_1F_2$ | He is chasing her. $M_1$ $F_1$ | |
| 15 | $F_2M_1F_1M_2$ | She is hitting her. $F_2$ $F_1$ | |
| 7 | $F_1M_1$ | She is kissing him. $F_1$ $M_1$ | |
| 14 | $M_2F_1F_2M_1$ | She is pulling her. $F_1$ $F_2$ | |
| 4 | $M_1F_1$ | She is jumping $F_1$ | |
| 13 | $F_2M_2F_1M_1$ | She is patting him. $F_1$ $M_1$ | |
| 11 | $M_2F_2M_1F_1$ | He is tickling her. $M_2$ $F_1$ | |
| 12 | $F_1F_2M_2M_1$ | He is tripping him. $M_2$ $M_1$ | |
| 8 | $M_1F_1$ | She is pushing him. $F_1$ $M_1$ | |
| 3 | $F_1M_1$ | She is sleeping. $F_1$ | |
| 16 | $M_2M_1F_2F_1$ | She is carrying him. $F_2$ $M_2$ | |
| 1 | $M_1F_1$ | He is flying. $M_1$ | |